

S.N. 10/064,152

RD-29,326

The listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS

Claim 1 (currently amended): A coated ferromagnetic particle comprising a ferromagnetic core and a coating, said coating ~~comprising~~ consisting essentially of a residue resulting from a thermal treatment of a coating material comprising a polymer selected from the group consisting of polyorganosiloxanes, polyorganosilanes, and mixtures thereof.

Claim 2 (original): The coated ferromagnetic particle of claim 1, wherein said ferromagnetic core comprises a material selected from the group consisting of Fe and Fe alloys.

Claim 3 (original): The coated ferromagnetic particle of claim 2, wherein said ferromagnetic core has an average diameter in a range from about 10 micrometers to about 1 millimeter.

Claim 4 (original): The coated ferromagnetic particle of claim 1, wherein said polymer comprises a silicone polymer.

Claim 5 (original): The coated ferromagnetic particle of claim 1, wherein said coating material has a weight in a range from about 0.05 weight percent to about 1 weight percent of a total weight of said ferromagnetic core and said coating material.

Claim 6 (currently amended): A composite magnetic article comprising a compacted and annealed article of a desired shape comprising a plurality of coated ferromagnetic particles each comprising a ferromagnetic core and a coating, said coating ~~comprising~~ consisting essentially of a residue resulting from a thermal treatment of a coating material comprising a polymer selected from the group consisting of polyorganosiloxanes, polyorganosilanes, and mixtures thereof.

Claim 7 (original): The composite magnetic article of claim 6, wherein said ferromagnetic core comprises a material selected from the group consisting of Fe and Fe alloys.

RD-29,326

S.N. 10/064,152

Claim 8 (original): The composite magnetic article of claim 7, wherein said ferromagnetic core has an average diameter in a range from about 10 micrometers to about 1 millimeter.

Claim 9 (original): The composite magnetic article of claim 6, wherein said polymer comprises a silicone polymer.

Claim 10 (original): The composite magnetic article of claim 6, wherein said coating material has a weight in a range from about 0.05 weight percent to about 1 weight percent of a total weight of said ferromagnetic core and said coating material.

Claim 11 (currently amended): ~~A~~The composite magnetic article of claim 6 comprising a compacted and annealed article of a desired shape comprising a plurality of coated ferromagnetic particles each comprising a ferromagnetic core and a coating, said coating comprising a residue resulting from a thermal treatment of a coating material comprising a polymer selected from the group consisting of polyorganosiloxanes, polyorganosilanes, and mixtures thereof, wherein said composite article has a transverse rupture strength greater than about 100 MPa.

Claim 12 (currently amended): The composite magnetic article of claim ~~6~~11, wherein said composite magnetic article has a magnetic permeability greater than about 250 at a magnetic flux density of about 1 Tesla and a frequency of about 60 Hz.

Claim 13 (currently amended): The composite magnetic article of claim ~~6~~11, wherein said composite magnetic article has a core loss of less than about 35 W/kg at a magnetic flux density of about 1 Tesla and a frequency of about 60 Hz.

Claim 14 (currently amended): A method for making a coated ferromagnetic particle, said method comprising the steps of:

- a. providing an uncoated ferromagnetic core;
- b. providing a coating material ~~comprising~~ consisting essentially of a polymer selected from the group consisting of polyorganosiloxanes, polyorganosilanes, and mixtures thereof;

RD-29,326

S.N. 10/064,152

- c. encapsulating said uncoated ferromagnetic core with said coating material comprising said polymer; and
- d. thermally treating said coating material so as to convert said coating material into a residue;

to produce said coated ferromagnetic particle.

Claim 15 (original): The method of claim 14, wherein said ferromagnetic core comprises a material selected from the group consisting of Fe and Fe alloys.

Claim 16 (original): The method of claim 15, wherein said ferromagnetic core has an average diameter in a range from about 10 micrometers to about 1 millimeter.

Claim 17 (original): The method of claim 14, wherein said polymer comprises a silicone polymer.

Claim 18 (currently amended): AThe method of claim 14 for making a coated ferromagnetic particle, said method comprising the steps of:

- a. providing an uncoated ferromagnetic core;
- b. providing a coating material comprising a polymer selected from the group consisting of polyorganosiloxanes, polyorganosilanes, and mixtures thereof;
- c. encapsulating said uncoated ferromagnetic core with said coating material comprising said polymer; and
- d. thermally treating said coating material so as to convert said coating material into a residue;

to produce said coated ferromagnetic particle, wherein said coating material has a weight in a range from about 0.05 weight percent to about 1 weight percent of a total weight of said ferromagnetic core and said coating material.

RD-29,326

S.N. 10/064,152

Claim 19 (original): The method of claim 14, wherein the step of thermally treating said coating material is performed at a temperature greater than about 250 °C.

Claim 20 (currently amended): A method for producing a composite magnetic article, said method comprising the steps of:

- a. providing uncoated ferromagnetic particles;
- b. providing a coating material ~~comprising~~ consisting essentially of a polymer selected from the group consisting of polyorganosiloxanes, polyorganosilanes, and mixtures thereof;
- c. encapsulating each of said uncoated ferromagnetic particles with said coating material ~~comprising said polymer~~ to produce encapsulated ferromagnetic particles;
- d. subjecting said encapsulated ferromagnetic particles to a compaction to form a compact of a desired shape; and
- e. subjecting said compact to an annealing treatment;

to produce said composite magnetic article, wherein said composite magnetic article comprises a plurality of coated ferromagnetic particles wherein each particle comprises a ferromagnetic core and a coating, said coating ~~comprising~~ consisting essentially of a residue resulting from a thermal treatment of said coating material ~~comprising said polymer~~.

Claim 21 (original): The method of claim 20, wherein said ferromagnetic core comprises a material selected from the group consisting of Fe and Fe alloys.

Claim 22 (original): The method of claim 21, wherein said ferromagnetic core has an average diameter in a range from about 10 micrometers to about 1 millimeter.

Claim 23 (original): The method of claim 20, wherein said polymer comprises a silicone polymer.

RD-29,325

S.N. 10/064,152

2. Claim 24 (currently amended): AThe method of claim 20 for producing a composite magnetic article, said method comprising the steps of:

a. providing uncoated ferromagnetic particles;

b. providing a coating material comprising a polymer selected from the group consisting of polyorganosiloxanes, polyorganosilanes, and mixtures thereof;

c. encapsulating each of said uncoated ferromagnetic particles with said coating material comprising said polymer to produce encapsulated ferromagnetic particles;

d. subjecting said encapsulated ferromagnetic particles to a compaction to form a compact of a desired shape; and

e. subjecting said compact to an annealing treatment;

to produce said composite magnetic article, wherein said composite magnetic article comprises a plurality of coated ferromagnetic particles wherein each particle comprises a ferromagnetic core and a coating, said coating comprising a residue resulting from a thermal treatment of said coating material comprising said polymer, wherein said coating material has a weight in a range from about 0.05 weight percent to about 1 weight percent of a total weight of said ferromagnetic core and said coating material.

Claim 25 (original): The method of claim 20, wherein said annealing treatment is performed at an annealing temperature greater than about 400 °C.

Claim 26 (original): The method of claim 25, wherein said annealing treatment is performed at said annealing temperature in a range from about 450 °C to about 950 °C.

Claim 27 (original): The method of claim 26, wherein said annealing treatment is performed for an annealing time in a range from about one minute to about ten hours.

RD-29,326

S.N. 10/064,152

Claim 28 (currently amended): The method of claim 2024, wherein said annealing treatment comprises a first annealing treatment and a second annealing treatment wherein said first annealing treatment is performed at at least a first annealing temperature for a first annealing time followed by said second annealing treatment performed at at least a second annealing temperature for a second annealing time.

Claim 29 (original): The method of claim 28, wherein said first annealing temperature is in a range from about 450 °C to about 950 °C; said first annealing time is in a range from about one minute to about ten hours; said second annealing temperature is in a range from about 300 °C to about 600 °C; and said second annealing time is in a range from about one minute to about fifty hours.

Claim 30 (original): The method of claim 20, wherein said compaction is performed using a compaction pressure in a range from about 250 MPa to about 1300 MPa.

Claim 31 (original): The method of claim 20, wherein said compact is subjected to a decomposition treatment prior to said annealing treatment.

Claim 32 (original): The method of claim 31, wherein said compact is subjected to said decomposition treatment at a temperature of greater than about 250 °C for between about one minute and ten hours.

Claim 33 (currently amended): The method of claim 2024, wherein said composite magnetic article has a transverse rupture strength greater than about 100 MPa.

Claim 34 (currently amended): The method of claim 2024, wherein said composite magnetic article has a magnetic permeability greater than about 250 at a magnetic flux density of about 1 Tesla and a frequency of about 60 Hz.

Claim 35 (currently amended): The method of claim 2024, wherein said composite magnetic article has a core loss of less than about 35 W/kg at a magnetic flux density of about 1 Tesla and a frequency of about 60 Hz.

RD-29,328

S.N. 10/064,152

Claim 36 (original): The method of claim 20, wherein the step of encapsulating each of said uncoated ferromagnetic particles is done by a process selected from the group consisting of a dip coating process, a spray coating process, a fluidized bed coating process, and a precipitation coating process.

Claim 37 (original): A device using electromagnetic materials comprising the composite magnetic article of claim 6.

Claim 38 (original): The device of claim 37, selected from a group consisting of stators, rotors, solenoids, cores for transformers, inductors, actuators, MRI pole faces, and MRI shims.